does not have preemption authority of state and local regulations when those regulations are for bona fide health and safety concerns. Accordingly, states and local jurisdictions make more stringent regulations for any Commission licensed facility for the health and safety of the general public or of workers, and when there is a bona fide scientific basis for such regulations.

Likewise, recently on May 7, 1997 a Illinois county circuit court applied Verb v. Motorola and noted,

"Defendant's [Motorola, Inc.; NEC America, Inc; and Cellular Telecommunications Industry Association, and Ronald Nessen ("CTIA")] reply brief appears to argue that, although there is no FDA safety standard, there are standards set by the FCC and the American National Safety (sic, better should be 'Standards') Institute regarding the output allowed for cellular phones. This argument is irrelevant, as the FCC is empowered to regulate frequencies and power of telecommunications items. 'Congress has not empowered the FCC to regulate cellular telephones with regard to health effects and public safety (and cited Verb v. Motorola).' [Debra K. Wright vs. Motorola Inc., et al, Circuit Court of Cook County, Illinois, County Department, Law Division, Judge Paddy McNamara, Circuit Court -236, May 7, 1997]

The Commission should note that the above reference to "telecommunications items" includes personal wireless services facilities. Thus Wright v. Motorola above would also find that preemption of bona fide health and safety regulation of personal wireless services base station facilities is also not preempted by the Commissions rules.

3.5.3 Congress explicitly gave power to the states to regulate telecommunications concerning public safety and welfare

It has been noted that *"Congress does not cavalierly preempt all state law causes of action."* [Medtronic, Inc. v. Lohr, U.S. 116 C.Ct. 2240, 2250 (1996)]. Also, *"there is a strong presumption that Congress must affirmatively oust or divest state courts of jurisdiction over a federal claim"* [Grotemeyer v. Lake Shore Petro Corp. 235 Ill. App. 3d 314 (1st Dist. 1992].

Now regarding the TCA of 1996, Congress has stated explicitly and affirmatively in the section concerning "Removal of Barriers to Entry" that,

"Nothing in this section shall affect the ability of a State to impose, on a competitively neutral basis and consistent with section 254 (Universal Service), requirements necessary to preserve and advance universal service, protect the public safety and welfare, ensure the continued quality of telecommunications services, and safeguard the rights of consumers." [TCA of 1996 sec.253 (b)]

Accordingly, Congress has explicitly given states the authority to regulate telecommunications facilities for the purpose of protecting *"public safety and welfare"*. Moreover, Congress made this provision which could regulate entry in the very TCA section on *'removing barriers to entry.'* This clearly demonstrates that in the area of health and safety state jurisdiction is to remain in effect over all Commission licensed facilities.

Consider that "*Congress can assert exclusive power either by explicit statutary language or by regulating matter in such detail as to leave no room for state involvement.*" [U.S.C.A. Const.Art. 6.cl 2] However, we see above that not only have the courts found that the Commission does not have peremptory authority regarding health and safety matters [noted in item 3.5.1 as per Verb v. Motorola and per Wright v. Motorola], but that in Sec. 253 of the TCA, Congress explicitly gave authority to the states to regulate for the purpose to "*protect the public safety and welfare*."

3.5.4 A specific authority given to states overrides a general preemption by the Commission. The courts have found that even if there is a general preemption authority given to a federal agency, if nevertheless Congress gives a specific authority to states then there is no preemption. Consider State of Calif. v. Tahoe Regional Planning Agency, there the courts stated,

> *"and even if statute preempted and precluded state jurisdiction to prevent navigational hazards, Congress approved compact which established jurisdiction of Tahoe Regional Planning Agency."* [State of California v. Tahoe Regional Planning Agency, 664 F.Supp. 1373 (E.D. Cal. 1986]

So to in our case, even if Congress may have given the Commission general authority in Sec. 704 to preempt state and local regulations of personal wireless services due to the general environmental effects of radiofrequency emissions, Congress nevertheless explicitly gave states in Sec. 253(b) the authority to regulate Commission facilities to *"protect public safety and welfare."* Accordingly, just as with State of California v. Tahoe Regional Planning Agency, so to here the specific authority given to states to regulate health and safety overrides any general preemption authority given to the Commission and which did not mention health and safety matters.

3.5.5 The Courts have allowed states to regulate "intensity of use" and other operations even when aspects of federal law preempted state regulation

Consider Faux-Burhans v. County Commissioners of Frederick County 674 F. Supp. 1172 (D.Md. 1967). In this case it was found that concerning the Federal Aviation Act of 1958 that,

"Federal law did not preempt county zoning ordinance insofar as it regulated private airfield; ordinance did not regulate noise emissions or actual conduct of flight operation within navigable air space, but rather regulated intensity of use, type of aircraft that could use airfield, clear zone at runway ends, locale of operation, and type of aircraft operations." [Id. at 1173].

In the case of regulating radio-frequency per TCA sec. 253 and per sec. 704, it is again noted that Congress removed operation from the list of preempted functions. Moreover, since sec. 253 expressly provides for states regulating to protect public safety and welfare it is seen that Congress has not chosen "to enact pervasive scheme of regulation of subject matter." [Id. 1172, 1173].

3.5.6. In the TCA of 1996 Congress did not clearly manifest its intent to supersede state and local laws concerning health and safety and so there is no preemption of bona fide state health and safety regulations.

Congressional authority to preempt can be limited. In Maurer v. Hamilton[23] litigants challenged a Pennsylvania statute prohibiting the carrying of cars over truck cabs as conflicting with the Interstate Commerce Commission's national regulation of the field under the Motor Carrier Act of 1935. Yet the Court deferred to state legislation where public safety and health are involved, and stated that Congressional intent to supersede a state safety measure must be clearly manifested.[24,25] However, with respect to the Telecommunications Act of 1996 (P.L. 104-104) ("Act") 'health and safety' issues are explicitly addressed in Sec. 253 wherein Congress states nothing in the Act pertaining to removal of barriers to entry (sec. 253) and universal service (sec. 254) shall affect the ability of a State to impose requirements necessary to protect public safety and welfare. However, in Sec. 704 which the Commission cites, while there is a focus on land use and zoning regulations, the section does not manifestly and explicitly specify that the regulation of these facilities to protect public safety or welfare is preempted. Accordingly, by sec 253 of the Act, and by court rulings[24], states have jurisdiction to set radio-frequency exposure requirements for bona fide reasons to protect public health and safety, and Sec. 253 takes precedence over Sec.

704 when the considerations for the *"placement, construction, and modifications"* are based upon bona fide public safety and welfare concerns, since preemption of public safety and welfare authority was not explicitly manifest in Sec 704 which dealt with general zoning and land use considerations on the basis of the environmental effects of radiofrequency emissions. Yet, as noted above, the authority of States to set requirements to protect public safety and welfare were explicitly and manifestly acknowledged in Sec. 253. Moreover, the main concerns of states and local jurisdictions pertain to new facilities being constructed in residential and commercial areas which relates to the entry of new services, and it is this section 253 which explicitly addresses the issues of removal of barriers to entry which also provides for states to maintain state authority for public safety and health.

3.6 There is no basis for a preemption based on the rules for preemption:

Congressional intent can be determined by

(i) the pervasiveness of the federal scheme,

(ii) the need for uniformity,

(iii) clear intent by Congress in the statute to preempt

(iv) the danger of conflict between the enforcement of state laws and the administration of the federal programs.[26] In our case uniformity is specifically not sought at the federal level, but rather that the Commission is only allowed to preempt only 'personal wireless services facilities' and not any other kind of Commission licensed facilities. Moreover, "personal wireless services facilities" regulation was only allowed by Congress for certain purposes. Also, in Sec. 253, Congress expresses its intent to allow for state to state variability in insuring public safety and welfare.

Also, for examples when the rights of states prevailed consider Pacific Gas & Electric Co. v. State Energy Resources Conservation & Development Commission[27].

Hence it is seen that with respect to regulating Commission licensed facilities for the purpose of protecting public safety and welfare that:

(i) the federal scheme is not pervasive, but allowed state to state variability for non-personal wireless services and for protecting the public safety and welfare that all licensed facilities may be regulated by states

(ii) There is no intent for uniformity, given (i) above

(iii) There is no clear Congressional intent to preempt bona fide state health and safety statues regulating personal wireless services facilities

(iv) There is no basis for finding in general that any such regulation will cause a conflict with federal law making compliance with both federal and state law impossible,

(v) There is no basis for finding that such regulation will be an obstacle to the intent of the Congressional act since (i) the TCA has as part of its intent that states may regulate to protect public safety and welfare, and (ii) sec. 704 states that any curtailing of allowed state regulation be done on a case by case basis[21a,b].

3.7 Accordingly the Commission should issue a notice changing its FCC 96-326 rule and order as follows:

(i) In paragraphs 166,167, 168 the Commission should be clear that it denies the petitions for the Commission to preempt more than regulations for the "placement, construction, and modification" of personal wireless services facilities because, as stated in the Senate/House Joint Statement, "Section 704 prevents Commission preemption of local and State land use decisions and preserves the authority of State and local governments over zoning and land use matters," except as for the placement, construction, and modification" of personal wireless service facilities based upon the environmental effects of radiofrequency emissions from such facilities, and hence the Commission no longer has authority for such preemption."

(ii) In consideration of the above, other evidence herein and presented in this proceeding, the Commission should state that it does not preempt state or local jurisdiction regulation of the "placement, construction, and modification" of personal wireless service facilities when such regulations are, in accordance with Sec. 253 of the Telecommunications Act of 1996, for bona fide measures to protect public health and welfare.

(iii) The Commission should correct its statement that,"Section 704 of the Telecommunications Act amends the Communications Act by providing for federal preemption of state and local regulation of personal wireless service facilities on the basis of RF environmental effects." [in FCC 96-326 para. #166]. Rather it should state, "Section 704 and Sec. 253 of the

Telecommunications Act amends the Communications Act by providing for federal preemption of state and local regulation of personal wireless service facilities on the basis of RF environmental effects, but not when such regulation is for bona fide reasons to protect public health and welfare as provided for in Sec. 253 of the Telecommunications Act."

3.8 Additional considerations on 'not standing as an obstacle': Additional considerations indicate more stringent state or local regulations should not be expected by the Commission "to stand as an obstacle" to the intent of Congress.

The Commission has stated,

*"For antennas mounted higher than 10 meters, measurement data for cellular facilities have indicated that ground-level power densities are typically hundreds to thousands of times below the new MPE limits.*43"

Moreover, the Commission has stated, "Typical heights for cellular base station towers or structures are 50-200 feet" and, "that 'worst-case' ground level power densities near typical cellular tower are on the order of 1 microwatt/sq. cm. or less"114. Accordingly, since the Commission finds that exposures from typical wireless services facilities are far below existing limits, there should not be much concern that some more restrictive limits would result in a significant obstacle since the Commission finds exposures from these facilities are now relatively low.

Moreover, now or very soon telecommunications satellites will provide communications services to users of hand-held phones so that the concerns for universal service can be met without ground base stations.[115,116] Also, it seems soon there will be a technology of 'inexpensive' communications stations 20 miles high in the form of remotely piloted, solar powered airships which can provide more 'local' communications links without the need for ground base stations [Science News, Jan. 11, 1997, pg. 29, and June 10 ex parte page. 61]. Thus these technologies help assure that the federal goals of universal service will not be obstructed by efforts of states to provide safe levels of RF exposure, since the exposure levels from these 20 mile and higher systems will be extremely low and also due to their height they will be beyond state and local jurisdiction authority. Thus, feasible means exist to assure that any state or local jurisdiction regulations will not be an obstacle for carrying out a Congressional mandate of universal service

4. Allowing exposures at levels where there are biological effects observed puts obligations upon the Commission concerning consent required for experimentation, or at least notification

4.1 No experimentation without consent: The Commission does not have authority to perform experiments on a population receiving a level of SAR exposure from a nearby Commission licensed facility where biological effects at such an SAR have been observed and it is uncertain whether the effect is a health hazard or not. Exposing such a population, is in its essence an experiment, although intended for telecommunications benefits. If experiments are done on a population it must be with their consent. As noted in the Ad-Hoc June 10 submission, population near personal wireless service facilities base stations have been predicted to receive 0.2 microwatts per sq. cm which is over 100 times the 0.2 microwatts per sq. cm to which 95% of the U.S. population has been exposed[20]. Also the Ad-Hoc Association FCC96-326 Petition presented engineering reports predicting 20 or more microwatts per sq. cm. power density which is 4000 times higher exposure than the 0.005 microwatts per sq. cm. median U.S. exposure reported by the EPA in 1986[19,20] [footnote 19, 20 are the same references for statements in the Ad-Hoc June 10 submission, section 21 (1) on page 58]. Thus it is clear that exposure levels near many Commission licensed facilities are substantially higher than background exposure levels which were present when owners selected a property and determined it would be fit for their intended use. Hence, exposing a population to many fold higher exposures when there is uncertainty of effects is experimentation, and permission must be received.

If the Commission will not find it must do as requested, then, without such permission, assure at least compensation for the 'taking' of the property by severe impairment of its use by causing anxiety to its inhabitants as well as biological effects on their bodies - which is a taking of use without permission, as noted in item 3.3 and 3.4 above.

4.2 If the Commission will allow experimentation without consent, then at least require informing those exposed to levels at which biological effects from RF have been observed plus a provision for what would be a traditional protection limit to protect from the effect (1/100th the level of the 'threshold' of the effect, as reported by EPA[19] [Ad-Hoc Assn. FCC 96-326 petition at pg. 15].

4.2.1. SAR concerns: The lowest levels at which a perceived adverse effect has been reported in a paper deemed suitable for standard setting is 10 micrwatts/sq.cm. at 2380 MHz to rats (0.006 W/kg or less)[40]. Since this is 7.5% of 0.08 W/kg which is the basis of the Commission's present limits, then new limits with a traditional safety factor of 100 would be 0.075% or 0.00075 of present Commission 'safe' limits. There is also a concern with 'biological' effects which a reasonable person would not want to occur, such as changing of brain wave EEG patterns, which have bee reported to occur in rabbits at an average SAR of 0.0001 W/kg[41,42], which is 1/800th present Commission general public exposure limits. Applying a traditional safety factor of 100 yields limits that would be 1/80,000th present Commission exposure limits for the general public. The foregoing includes RF effects which have not yet necessarily been conclusively proven or even replicated, and includes effects referenced by the Ad-Hoc Association and other parties in this proceeding. And if the Commission will not make its limits as requested, then the Commission should require that its licensees inform those who may be exposed to levels above 1/80,000th of present general public exposure limits or the potential for effects to brain EEG, and the operator should indicate what possible health impacts this may imply, based upon what the federal, state, or local jurisdiction health agency shall advise.

4.2.2 Electrical interference concerns:

4.2.2.1: Interference with medical devices: It has been reported that,

- Cellular Base Station likely caused infant deaths:

"Modern digital mobile communications systems often utilize pulsed amplitude modulation. This modulation enhances the ability of the RF sources to interfere with medical device operation....Many medical devices are designed to monitor the physiological frequencies of the human body. There frequencies range from about 0.5 Hz to several hundred Hz, and overlap the modulation frequencies of digital mobile communication systems.....in the early 1990s, in the United States, over 60 infant died over a period of a few years while being monitored for apnea (breathing cessation). The deaths were associated with unexplained failures of one model of apnea monitor to sound its audible alarm when patient breathing ceased. It was shown subsequently that this device was extremely susceptible to interference from RF fields produced by certain mobile communication base stations several hundred meters away, and by FM radio broadcast stations over one kilometer away".[68,117]. [quote from page 66 of footnote 68]

Subsequent testing of apnea monitors by the Food and Drug Administration found,

"This testing demonstrated that many different models of apnea monitors failed to operate properly when subjected to field strengths below 3 V/m. The most radio-frequency interference sensitive model failed in an unsafe manner when exposed to field strengths as low as 0.05 V/m in the 88 to 108 MHz FM radio broadcast band as follows: When amplitude modulation of 0.05 Hz was imposed on the RF carrier, the apnea monitor would fail to alarm when normal breathing had stopped." [117] [quote from page 72 of footnote 68].

Thus, the Commission is hereby informed that its 'safe' power density limits have likely resulted in the deaths of some infants and others using apnea machine models described above. Also, note that as medical devices become more complex, and monitor more critical body systems, and in a home environment, the risk of a fatal accident due to interference from the Commission's licensed facilities increases.

The International Electrotechnical Commission (IEC) 601-1-2, 1992 provides that medical devices be immune to 3 V/m in the 26 MHz to 1000 MHz frequency range[68] [section 3.8.1 of footnote 68.]. This corresponds to a power density of 2.4 microwatts per sq. cm. Commission limits allow for 200 to 1000 microwatts /sq. cm. in 47 CFR §1.1310 adopted in FCC 96-326.

- Commission action needed

Were the Commission to grant the requests of the Ad-Hoc Association FCC 96-326 Petition at page 15 and 16, item 19, then the Commission would set exposure limits below 1 microwatt per sq. cm. in the 26 MHz to 1000 MHz range and thus avoid potential fatalities due to its relatively high limits.

However, if the Commission will not put its limits below that where international standards help protect against electrical interference, then the Commission should at least require its licensees to warn persons who are predicted to be subject to greater than 2.4 microwatts/sq. cm of possible electrical interference. Otherwise, to not so require this preventive prudent action, the Commission may appear to act without due diligence and prudence. Moreover, for the same reasons since it has been observed that fatal accidents can occur due to malfunction of medical devices as low as 0.05 V/m (see above) it would set is limits to below these levels, or if not to at least require persons expected to be exposed to these levels to be warned of potential interference. This can be accomplished by sending notices once per year or the posting of signs in

the area exposed to levels at which interference to medical devices has been observed or above which IEC protections are not anticipated.

- Hearing aids

"In 1995, the IEC initiated a product-specific electromagnetic interference (EMI) performance standard for hearing aids. This draft requires an immunity of 3 V/m for frequencies 800-960 MHz (e.g. the same as for medical devices) and 2 V/m for frequencies 1400-2000 MHz [68,119,120,121]." Moreover, a study presented at COST found significant interference to hearing aids occurs at 4 V/m, which corresponds to 4.2 microwatts per sq. cm. [see Ad-Hoc Assn. FCC 096-326 petition at page 16][120].

- Commission action: As above, for reasons both of interference and due to biological effects noted in this proceeding, the Commission should set its limits below those at which there may be hearing aid interference. Such interference adversely affects the quality of the human environment and needs to be considered in accordance with NEPA as noted in 3.1 above.

Moreover, many workers may wear hearing aids, especially communication workers who may service telecommunications facilities and who may be close to such facilities. The Commission must assure that its exposure criteria will not adversely affect workers or those in the general public who wear hearing aids and who may be in areas where exposure exceeds that provided by FDA and other standards to prevent electrical interference. To allow such excess levels would violate the Americans with Disabilities Act which Congress did not authorize the Commission to do.

5. The Commission should make its licensees responsible for correcting the electrical interference they cause. Currently, 47 CFR §22.100(b)(1)(i) states,

"The Commission will take no action upon complaints of interference against any station which is operating within the Commission's rules and its authorization, except as provided in this section [which is the interference is such to significantly interrupt or degrade a radio service].

The Commission should require operators inform those who may be affected, and should require its licensees to compensate those who purchased hearing aid or medical devices receiving Food and Drug Administration (FDA) approval for costs of preventing or stopping electrical interference. For the Commission to approve of power density levels which can cause

malfunctioning of hearing aids and medical devices the FDA has licensed as suitable for consumer use, has the effect of undermining the FDA standard, and to this extent preempts it, which the Commission does not have authority to do. Therefore, the Commission must require compensation be made to those adversely affected so that proper steps can be taken to assure needed protection from interference caused by Commission licensees is provided.

6. The Commission must set RF exposure conditions based upon a public health perspective and not on that of scientists for establishing a scientific fact.

The Commission's RF criteria should be based upon acting with prudence and caution, and using a public health perspective, including using evidence that may not be sufficient to prove as a scientific fact some observed RF biological effects.

6.1 EPA panel experts urge less stringent evidence be used for setting exposure limits

At the EPA April 26-27, 1993 Radiofrequency Radiation Conference, a panel of invited experts discussed "Biological Effects Basis For Exposure Limits." Of the 6 panelist, 3 were members of the IEEE C95.1-1991 Standards Coordinating Committee 28, including its co-chairman, O.P. Gandhi. It was reported,

"One recommendation expressed by several panelists was that any federal standards development activities must carefully design the review process to avoid some of the problems that have occurred during the development of some of the non-federal RF radiation standards. These panelists felt, for example, that different criteria have been placed in the past on the selection of papers to use during the development of these non-federal standards. They also felt that overall there must be more of a willingness to accept certain publications, even though, because of reasons such as constrained funding, the results might not have had what might be considered by some to be adequate replication; any ensuing uncertainty resulting form such an approach can be incorporated into the standard.[122].

Likewise, M.Granger Morgan of the Cargenie-Mellon University, Department of Engineering and Public Policy stressed a similar view, and reported,

"Because they must always be concerned with protecting the integrity of scientific knowledge, scientists often guard against false positive findings by starting with the prior assumption of 'no risk unless clearly demonstrated.' Whatever the actual phrasing of the question, the question such a scientist will probably answer is 'Using the standard criteria employed to judge the veracity of scientific knowledge, how sure are you that a risk has been demonstrated?'

In contrast, the public health officials, who are professionally concerned with the possibility that people might be injured by false negatives, are likely to require a significantly

lower threshold of proof before they begin to consider it plausible that a risk may exist and decide that it is appropriate to take action to avoid exposure. Whatever the actual phrasing to the question, the question a public health official will probably answer is, "How likely is it that some people could suffer health damage if we do not take action today?'

Unfortunately, these fundamental differences in problem framing and operating assumptions are rarely discussed explicitly. Because the decision criteria of many scientists is likely to lead to more conservative decisions with respect to exposure abatement than that of many public health officials, stakeholders interested in avoiding regulatory action are likely to find their framing more attractive.

In the case of ELF fields this was a strategy regularly adopted by electric utilities a few years ago. Growing evidence of possible effects, and mounting public concern, have now moved many utilities closer to a public health decision framing. In contrast, many members of the computer and telecommunications industry are still clinging tenaciously to a very conservative scientific framing of the decision problem."[123]

Therefore, the Commission should ask the federal health agencies to respond to the claims and requests of the Ad-Hoc Association and other parties in this proceeding concerned about heath affects from a public health framing of the decision problem, and ask, given continued uncertainty and lack of 'conclusive proof', are there limits or other actions that the Commission should be taking?

7.. Comments on RF association with malignant tumor development

7.1 It is reasonable to expect that RF exposures for less than 3 months may not demonstrate a positive association with acceleration of malignant tumor development

In the Ad-Hoc June 10 submission, the Ad-Hoc Association emphasized considering only those animal - cancer studies where exposure was at least 3 months. Since the Commission has said it will rely upon the advice of the federal health agencies, then the comments of the FDA will bear noting. In commenting on a study by Santini [footnote 42 in the Ad Hoc June 10 submission] the FDA stated,

"One reason that this study may have given a negative result is that the mice only lived about 6 weeks after implantation of the highly malignant melanoma cells, dying of the effects of the tumor. The Szmigielski data shows that about 4 months of exposure is necessary before tumor progression is accelerated by microwaves."[124]

7.2 A University of Washington (UW) study found a more than 3 fold positive association between excess primary malignant tumors of 100 rats exposed to up to 25 months of RF exposure at 10% of the Commission's hazard threshold compared to 100 controls[125] This is an

exposure level considered 'safe' for the Occupational/controlled tier of the Commission, so this study is of especial interest.

7.2.1 A finding based on the 'aggregate' questionable biological significance?

The authors interpreted their results stating that,

"a finding of increased tumor incidence due only to aggregating tumors from all sites is of questionable biological significance[125]*."*

However, the Environmental Protection Agency has established that such a finding meets its minimum criteria for evidence of cancer[127]. Also, the Center for Device and Radiological Health of the Food and Drug Administration (FDA) in a 1993 report stated,

"Although this study has been discounted by some critics because no one tumor site or target organ predominated, this is precisely what one would expect for an agent which accelerates the progression of naturally occurring malignant cells[124]*."*

Thus, these authors of this study appear to hold a different view than the EPA and FDA which do find the cancer in the aggregate of biological significance.

7.2.2 Comparisons to untreated controls:

Another reason the authors of the U.S. Air Force sponsored UW study doubt the biological significance of their findings is that they cite another study[129] of cancer in a similar strain of rats as in their study. They state,

"However, we note that the incidence of this tumor [benign pheochromocytome of the adrenal medulla] *in the exposed group does not exceed the incidence of tumors reported in the literature*[129] *for this strain of rat housed under specific pathogen free conditions. Strict comparisons of these data with those from other laboratories cannot be made, however, because the animals were not subjected to parallel conditions*[125]*"*

Some reasons why the authors are correct in stating the animals were not subjected to parallel conditions include:

(i) Number of animals per cage: In the University of Washington study the animals were housed individually in separate wave guide 'cages', while the comparison study the animals were housed either 2 or 3 animals per cage for one breeding source (H) and 10 animals per cage for another breeding source (C).

(ii) Frequency of cage cleaning: In the UW study, it is noted that in the 2.5 hours per day were used for cage cleaning. In a description of the study it explicitly states animal cages are to be

cleaned daily.[128]. In contrast, the referenced article of historical controls stated the H breeding source had their bedding changed 1-2 times per week, and for the C breeding source *"Soiled bedding was vacuumed from the cages weekly and fresh bedding was added.*[129]"

Therefore, given the above differences in hygiene support the authors stating in comparison to the animals in the UW study, these untreated rats were "*not subjected to parallel conditions*[125]"

7.2.3 Immunological effects: It is interesting to note a separate technical paper for the Air Force analyzed a follow-up to the original UW study. Based on measurements made at 6 months and at 12 months, the technical paper reports,

"The most surprising and consistent finding of both exposure periods was the increased number of hematopoietic progenitor cells (CFL-C) in the marrow of exposed rats. Increased CFU-C can be explained by a decreased survival of mature monocytes, macrophages, and granulocytes in the peripheral lympoid tissues, which necessitates a compensatory increase in their progenitor cells, increasing their production rate. Finally, RFR may cause increased production of growth stimulatory hormones by macrophages, lung cells, and T cells; such hormones may then expand the pool of hematopoetic progenitors in the bone marrow."[130].

8. The Commission has overlooked or misunderstood its policy of relying upon the federal health agencies when it stated that in the future it would modify its rules when there is a consensus for change. The Commission has stated that it has chosen to defer to the recommendations of the federal health agencies with expertise in RF health and safety matters [FCC 96-326, para. #28].

Yet, in contradiction to this policy the Commission has also stated,

"We encourage these organizations [IEEE, NCRP] and other similar groups developing exposure criteria to work together, along with the relevant federal health agencies, to develop consistent, harmonized guidelines that will address the concerns and issues raised in this proceeding. We will consider amending our rules at any appropriate time if these groups conclude that such action is desirable." [FCC 96-326, para. 34].

Rather, the Commission will better serve the public interest, be consistent with its past policies and decisions, and decisions within FCC 96-326, if it would change the last sentence above and state instead,

"Insofar as the Commission will continue to rely on the recommendations of the federal health and safety agencies, we will be obliged to amend our rules if these agencies conclude that such action is desirable, and encourage these agencies and other parties to work together so such changes in our rules can occur in harmony with other parties concerned about

these matters. However, upon presentation of appropriate evidence, the Commission will consider setting standards more stringent that those which the federal agencies may now be willing to support, but we will not act adopt standards which conflict with federal health agency guidance."

9. The Commission should follow the advice provided by the federal health agencies and specify the elements of the development of future RF health and safety guidelines.

9.1 The FDA representatives to the IEEE C95.1-1991 balloting committee, M. Swicord stated, and M. Altman concurred, that

"I feel that the procedures agreed upon concerning membership and circulation of this document have not been fully carried out. A membership committee was appointed to consider a proper balance of representatives. To my knowledge this committee has not met. It is generally recognized that the current membership is not balanced in representing government, industry and the general public. Thus, the ballot may not represent a proper balance. Secondly, we agreed at the fall meeting in 1989 to send out this document for agency review and comment. The second point may be considered minor, but if the standard is to have credibility I feel it is necessary."[132]

9.2 The Commission should also note that difficulties with the text of the ANSI/IEEE C95.1-1992 standard were noted by the 'official' FDA response in November 1993[135] to the Commission's proposed RF rules, in which it was stated,

"The standard, as written, lacks a full explanation of its basis. In our opinion, it is unclear what types of biological effects and exposure conditions are addressed by the standard."

9.3 Likewise NIOSH in its letter to the Commission raised a concern about membership similar to those of Swicord and Altman of the FDA. NIOSH stated,

"NIOSH is concerned about the lack of participation of experts with a public health perspective in the IEEE RF standards setting process....This lack of public health perspective should be acknowledged by the FCC in adopting these guidelines for regulating occupational and environmental exposures to RF radiation."[136]

9.4 Conclusions: Therefore, the Commission should state that if parties which are developing RF standards wish to have those standards seriously considered by the Commission, then:

9.4.1 The standard setting process must assure representativeness of all stakeholders, and in particular federal health government agencies, industry, public health organizations, and the general public as noted by above by the FDA in 9.1 and 9.2 and by NIOSH in 9.3.

9.4.2 The standard setting process must assure open review by the federal health agencies. Also, since the future standard may be incorporated into federal and state governmental regulations, any proposed draft should be openly and widely made available as would any draft of a proposed governmental regulation. This will help assure a full an open review before, and not after, any standard is adopted.

9.4.3 The recommendations of Panel #6 at the 1993 EPA radiation conference should be followed by those agencies adopting RF standards, and in particular papers should not be excluded due to what some would find to be insufficient replications, but rather, as recommended by many panelists, "any ensuing uncertainty resulting from such an approach can be incorporated into the standard."[10] This is appropriate for the Commission to state, since it is prudent, consistent with the sound logic of M.Granger noted above[123], and is the recommendation of expert panelists selected by the EPA.

9.4.4 The Commission should state in the appropriate section of 47 CFR and its instructional books and public notices the protection provided by its RF criteria as requested by the Ad-Hoc Association FCC 96-326 Petition[137], and specifically report as directed by NIOSH that

"The National Institute of Occupational Safety and Health (NIOSH) has reviewed the standards upon which the Commission's criteria are based and NIOSH is concerned about the lack of participation of experts with a public health perspective in the IEEE RF standards setting process"

This should be done because the Commission should be consistent in its decision to follow its policy of deferring to the federal health agencies expert in RF health and safety matters. Indeed, since the Commission has stated,

"Therefore, in developing the new guidelines, FCC staff is considering an approach that , we believe, accommodates all the comments we received and responds to the recommendations made by the EPA and by the other federal health and safety agencies."[138] This clear intent by the

Commission to follow its policy of accommodating to the recommendations of the federal health agencies, further obligates the Commission to adopt the above NIOSH directive in 9.3, and all other directives by the federal health agencies which the Ad-Hoc Association has indicated in this proceeding that the Commission did not follow, perhaps due to being misunderstood or overlooked.

10. This is to clarify that requests of the Ad-Hoc Association that Commission licensees be required to have an RF safety program includes

10.1 Elements to include:

(i) that such a program applies to any worker, including both employees of a licensee of the Commission and employees of parties who may contract to provide services to licensees of the Commission,

(ii) that the program include the elements described by OSHA in its 1994 letter to the Commission in this proceeding,

(iii) that the RF health and safety program elements named by OSHA include the most up-to-date available technology and other health and safety considerations that the science of industrial safety has provided.

(iv) that states and local jurisdictions can assess what is expected as the most up-to-date industrial safety program, and that courts of local jurisdiction may adjudicate and determine if this requirement is met.

(v) That the Commission determine the extent it has jurisdiction in these matters by considering the precedent and content of the Nuclear Regulatory Commission, which as noted above, is in a situation similar to that of the Commission regarding issuing and having jurisdiction for health and safety matters.

10.2 Proposed test of regulation - based in part on NRC RF safety regulations in 10 CFR Chapter 20, Subpart B noted above:

In developing the following, the Ad-Hoc Association recognizes the Commission's concern that, *"Our NEPA responsibilities do not appear to encompass the issuance of specific rules on workplace practices and procedures."* [FCC 96-326, para 33] Accordingly, the Ad-Hoc

Association has avoided language which provides for the issuance of specific rules, but rather has adopted the approach of the Nuclear Regulatory Commission of specifying the broad elements, record keeping responsibilities, and similar considerations, without providing for the issuance of specific rules. Given the above, the Commission is requested to adopt the following RF program provisions into its rules.

Proposed text for Commission RF safety program

Section: (a) Each licensee shall develop, document, and implement a radiation protection program to apply to the health and safety of any to which the occupational/controlled environment criteria apply, and be commensurate with the scope and extent of licensed activities to ensure compliance with the provisions of this part.

(b) Documentation referred to in (a) shall include the licensee maintaining records of the radiation protection program, including:

(1) The provisions of the program, and

(2) Audits and other reviews of program content and implementation.

and the licensee shall retain the records of (1) and (2) above until the Commission terminates each pertinent license requiring the record. The licensee shall retain the records required by (1) and (2) above for 3 years after the record is made. The location of these records shall be given to the local jurisdiction as part of the documents to be associated with any use permit unless otherwise directed by the local jurisdiction. Workers as defined in this section may request to see and copy these records.

(c) The licensee shall use to the extent considered in keeping with the most modern occupational health and safety approachs based upon sound radiation protection principles to achieve occupational/controlled exposure levels and exposure levels to the general public/uncontrolled population that are as low as reasonably achievable (ALARA), and shall accomplish this through a comprehensive RF safety and health program whose RF protection elements shall at least include: (1) it is a written program, as specified in (b)(1) above, and provides for (2) training, (3) medical monitoring, (4) protective procedures, (5) and engineering controls, (6) signs, (7) hazard assessment, (8) employee involvement, (9) designated

responsibilities for program implementation, (10) the program has the effect of mitigating any potential increase in risk above that to which the general population may be exposed, (11) these protections should extend to workers employed by licensees, and to workers of those with whom licensees may contract (and who must show the licensee a statement of evidence by a competent authority of such program), (12) audits and other reviews of program implementation shall be made by persons who are competent to do so.

Medical monitoring shall include those parameters which the scientific database has found to be most senstive to RF effects, and shall thus include behavioral measurements which shall include measurement of memory function, attention, latency of response, motor function, and other central nervous system measures, as well as immunological and other measures which the scientific database has found on some occasions to appear to be senstive to low levels of RF exposure.

The RF safety program shall explicitly provide for clothing and other protections to mitigate any increased exposures when workers are servicing or reparing transmitters which are in areas where there are co-located transmitters nearby of the same or other operators.

(d) Federal, state, or local jurisdictions who have authority over worker health and safety matters are hereby given authority to set specific criteria, determine qualifications of those who are competent to make audits, make specific regulations consistent with the requirements in this part, may take action, and set penalties if it is determined that the requirements in (c) above are not met.

(e) Any controversy or conflict of whether the requirements in (c) are met may be resolved by petitioning a court of competent jurisdiction to decide the matter in accordance with the Telecommunications Act of 1996 Sec. 704(a)(B)(iv) and Sec. 253(b)

(f) The ALARA principle provided for in (c) above means making every reasonable effort to maintain exposures to radiation as far below the exposure limits set by the Commission as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and

safety, and shall consider the likelihood of potential adverse effects and their potential impact, and shall not require scientific certainty before taking such action or considerations, and other societal and socioeconomic considerations, and in relation to utilization of radio-frequency energy and licensed facilities in the public interest."

(the above language is very similar to 10 CFR §20.1003 ALARA definition). The above does not apply to amateur radio operators.

10. Additional monitoring matters:

10.1 States or local jurisdictions may find that operators are not properly reporting or monitoring exposure may require that such operators contract with organizations which a state or local jurisdiction finds responsible to do such reporting and/or monitoring, and those choosing to do so are delegated authority by the Commission, in accordance with Ad-Hoc Association FCC 96-326 Petition at para. #11 page 8.

10.2 Availability of certain records: In Appendix A of FCC 96-326, Final Regulatory Flexibility Analysis, Part IV, Summary of Projected Reporting, Recordkeeping and Other Compliance Requirements state, *"Applicants that are subject to the new RF radiation guidelines are required to make a statement on any application filed with the Commission indicating they comply with the RF radiation limits. Technical information supporting that statement must be retained by the applicant, and provided to the Commission upon request."* To this instruction should be added, "This information shall also be filed with any use permit application and any measurement updates shall be appended to this application unless the local jurisdiction provides another place where such information will be publicly available. Workers who may meet the occupational/controlled criteria should also be informed of the location of the above technical information and have the opportunity to review it prior to the licensee making an application to the Commission.

11. The Commission should:

11.1 State pertaining to the part of its rules on radio frequency exposure guidelines that

"Nothing in this part shall be construed as limiting actions that may be necessary to protect health and safety." This provision is also required in the regulations of the Nuclear Regulatory Commission [10 CFR §20.1001(b)] and is in the public interest to do so in the Commission's rules.

11.2 Because (i) there is much uncertainty as to the health impacts of radio frequency, (ii) there is reason to anticipate adverse effects, (iii) process of modifying the Commission's RF guidelines requires much time, and (iv) there is new scientific information becoming available, the Commission should state, that its requirements are based upon information available to the Commission, and that by basing its standards on a hybrid of NCRP 1986 and IEEE 1991 that the latest cut-off date for publication was the end of 1985, and that more recent scientific papers may indicate more stringent criteria is needed. Therefore, state,

"Commission licensees are responsible for keeping informed of the latest scientific findings, and must adjust their exposure conditions when this is indicated to protect the health and safety of workers and the public."

If there is controversy concerning this provision, then concerned parties may petition a court of competent jurisdiction *to decide the matter in accordance with the above and in accordance with Telecommunications Act of 1996 Sec. 704(a)(B)(iv) and Sec. 253(b)*

11.3 Need to provide for responding in a timely manner to new scientific findings

11.3.1 Accordingly state that "States and local jurisdiction may take whatever additional bona fide actions are appropriate to protect public safety and welfare both in the general population or in the work place," in accordance with the Telecommunications Act Sec. 253.

11.3.2 The above is indicated because of the need for the Commission to provide some means of allowing local jurisdictions to quickly respond if and when there is new scientific information justifying more stringent limits. As noted in this proceeding, In August of 1996 the Commission adopted the RF health and safety standards of the NCRP a full ten years after they were adopted in 1986 by the NCRP; indeed, it has been noted that NCRP 1986, did not consider in its criteria, but noted as a consideration for future standards, a study showing more than a 3 fold increase in primary malignant tumors at an exposure deemed 'safe' for workers . Also, as noted in the Ad-

Hoc June 10 1997 submission at pages 4-6, the Commission did not adopt the more stringent 1986 NCRP criteria even after the EPA publicly reported in 1986 the Federal Register19 that the Commission's 0.4 W/kg limit for an average whole body specific absorption rate (SAR) was "likely not protective to sensitive persons" to protect from thermal effects.[19]. Yet, even after being so advised by way of the Federal Register, the Commission did not adopt the recommended limits until 10 years later. Moreover,

- even though the Commission has stated it defers to the recommendations of the federal health agencies, and
- even though the EPA advised the Commission in its November 9, 1993 letter to adopt the NCRP 1986 criteria, with certain additional provisions, and
- even though the EPA stated that the ANSI/IEEE C95.1-1992 standard made "unwarrented" and "unsupported" claims, and,
- even though the FDA in its November 10,1993 recommendations to the Commission reported that the Commission should not adopt the exclusions which would apply to hand-held devices in the ANSI/IEEE C95.1-1992 standard,

nevertheless, in spite of all of the above, as an interim measure the Commission did adopt in 1994 the ANSI/IEEE C95.1-1992 standard to apply to Personal Wireless Services.

Thus, there is good cause to find that the Commission takes considerable time, even up to ten years, to adopt 'recent' standards, and that, perhaps due to overlooking or misunderstanding pertinent communications, the Commission has in the interim adopted standards and otherwise took actions that federal health agencies specifically warned against doing.

11.3.3 Given this experience, it is just, fair, prudent, and in the public interest, for the Commission to provide some means for workers and for members of the general public to seek in their local area more stringent regulation of the "placement, construction, and modification," of personal wireless services facilities due to the environmental effects of radiofrequency emissions from these facilities. By the Commission providing that states and local jurisdictions may make such regulations for bona fide health and safety reasons and with bona fide justifications, the Commission thereby provides for the latest scientific information to be applied.

The Commission has said, *"we intend to continue our cooperative work with industry and with the various agencies and organizations with responsibilities in this area in order to ensure that our guidelines continue to be appropriate and scientifically valid."* [FCC 96-326]. Yet, it was pointed out by the EPA, the federal health agencies, and by the Ad-Hoc Association in this proceeding

- The 1986 NCRP guidelines are based upon research through 1982, and the ANSI/IEEE C95.1-1992 standard is based upon research through 1985, and many find important papers which were available not considered by the these standards, as was noted in this proceeding.

- Accordingly, the Commission's criteria are based upon research that is at best 11 years old, and therefore, potentially not scientifically up to date. Indeed, many scientifically based findings since then have been provided by the Ad-Hoc Association and others in this proceeding to indicate the Commission's standard is not up to date and is not scientifically valid.

Therefore, given all of the above and what has been presented in this proceeding, the Commission should state in its rules the provision in 11.3.3 and 11.3.1 above.

12. Fines and penalties:

Commission should clarify that in order to provide for the public safety and welfare, and in accordance with the Telecommunications Act of 1996 Sec. 253 that Commission licensed facilities are not exempt from fines and penalties which states or local jurisdictions may otherwise set to help assure compliance with state and local law and regulation, and states and local jurisdictions may fine and penalize Commission licensed facilities for not complying with state and local law and regulation as well as with Commission health and safety regulations. Once a facility has been placed, constructed, and all facility modifications made, then when the facility is in operation such fines and penalties pertain to the "operation" of Commission facilities which states and local jurisdictions can regulate.

13. Exposure criteria of the Commission is inappropriate for workers or members of the public who are not 'in control' of their exposure and who are in transit through areas where there are exposures at levels allowed for the occupational/controlled exposure level.

13.1 The Commission rules provide, in opposition to the recommendations of the federal health agency recommendations and in oppositition to its own decisions, that

"Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure." [47 CFR §1.1310 Table 1 Note 1 to Table 1]

13.2 However, the Commission has stated repeatedly, as noted by the Ad-Hoc Association in this proceeding, that it will defer to the recommendations of the federal health agencies concerning RF health and safety matters, and in response to EPA recommendations the Commission has stated,

"Specifically, we are adopting limits for field strength and power density that are generally based on Sections 17.4.1 and 17.4.2, and the time-averaging provisions recommended in Sections 17.4.1.1 and 17.4.3..." (of the NCRP 1986 standard - see FCC 96-326 footnote 1). Section 17.4.3 pertains to "Time averaging for the General Population," and provides for averaging exposure over a 30 minute period, but provides that exposure during any 6 minute period not exceed that for occupational exposure. It also states in this section,

"At the same time, the 30 minute time-averaging period is responsive to some special circumstances for the public at large. Examples are transient passage by the individual past high-powered RFEM sources, and brief exposure to civil telecommunications systems."

13.3 Therefore, when NCRP addresses the issue of "transient passage" by members of the general public into areas where there may be exposure associated with the occupational/controlled setting, that the 30 minute averaging period "is responsive" to this circumstance, and thus exposure of such persons is still to be associated with the 30 minute and 1/5th lower limits of the general population/uncontrolled setting.

However, due to perhaps overlooking or misunderstanding, the Commission has decided otherwise, and has adopted the provisions of ANSI/IEEE C95.1-1992, and the definition of "controlled" area which allows exposure incurred not only to workers but also *"by other cognizant persons, or as a result of transient passage through areas* (where the higher exposure tier is operative)"

13.4 And the Commission's provision in 13.1, permits the higher exposure upon just being *"made aware of the potential for exposure"* either for members of the public or for workers not involved with RF matters to the extent they meet the occupational/controlled criteria. Yet, EPA, NIOSH, and OSHA told the Commission explicitly and with much emphasis that they objected to allowing increased exposure based upon mere awareness.

13.4.1 OSHA told the Commission "The possible implication that employees may be subjected to a higher level of risk because they 'are aware of the potential for exposure...' is unacceptable to OSHA[139]"

13.4.2 NIOSH told the Commission, "It is extremely difficult to assess the level of a worker's knowledge[136]"

13.4.3 EPA told the Commission, *"We strongly disagree with the concepts of control and awareness...,"* and *"awareness can vary from complete knowledge to almost no knowledge"*, and *"Unspecified awareness in itself does not constitute a controlled situation."* Also, *"Therefore, it is appropriate for the FCC to adopt this approach to apply the more conservative guidelines where there is any question of possible exposure of the general public (which might also include nontechnical employees).*[140]"

13.4.4 Moreover, as noted previously, the Commission stated it would follow the federal health agency guidelines.[134]. Yet, in spite of all of the above, the Commission has not adopted the 17.4.3 time averaging guidelines insofar as they are to be responsive to transient passage through certain areas, and the Commission has adopted exposure of the general population and nontechnical workers based only on 'awareness', which is the approach of ANSI/IEEE C95.1-1992 which the Commission said it would not adopt.

Moreover, since children, the elderly, non-English speakers, and others may pass through areas open to the public, it makes sense to not place them in a category where they may be continuously exposed for hours at the higher tier of exposure. And if the Commission will say these limits apply only to situations where persons are in the area only a few minutes, then this is exactly the case to which NCRP 17.4.3 applies and is responsive, and finds that a 30 minute averaging time is sufficient.